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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/695,519

10/28/2003

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298/03657

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06/27/2007

EXAMINER

WANG, QUAN ZHEN

ART UNIT

PAPER NUMBER

2613

MAIL DATE

DELIVERY MODE

06/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/695,519

Applicant(s)

ZALEVSKY ET AL.

Examiner

Quan-Zhen Wang

Art Unit

2613

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-66 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, "an optical network comprising: a) an optical path carrying an optical signal comprising a series of transmitted data units, each data unit having one of a discrete set of different amplitudes; b) an apparatus for the in-channel estimation of the OSNR, according to claim 55; and c) a beam divider for diverting a portion of the power of the optical signal from the optical path to the apparatus" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

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the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to because descriptive labels are needed for the rectangles in fig. 1. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 20-30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claim 20 recites the limitation of "where the transformation is linear".

However, the instant specification does not describe or teach how to perform the linear transformation. All of the examples disclosed in the instant application show that the transformation is nonlinear. For example, a frequency filter performs a nonlinear transformation on the signal that passes through the filter. Therefore, the specification does not enable claim 20 and its dependent claims 21-30.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-54 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. Claim 1 recites the limitations of "a) selecting a portion of the signal; b) measuring, at least once, at least an indication of the selected portion of the signal; c) repeating selecting a portion of the signal, and measuring; and d) estimating the OSNR from the results of at least one of the measurements, wherein consecutive measurements begin at times which differ by more than a shortest interval from one data unit to the next data unit". However, the claim omits essential steps of

generating or producing measurement results from the measurement steps. Without the essential steps of what kind results the measurement steps produces or generate, the claim is incomplete.

6. Claims 55-66 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted element is: a control element that controls the optical gate to perform gating functions.

7. Claims 5-6, 14, 32-38, and 51-54 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation of "determining a difference between the result of the at least one measurements, and an expected noiseless result of the said measurement". However, it is not clear what it means by "an expected noiseless result of said measurement".

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 4-6, 14-15, 32-33, 37-38, and 51-56 are rejected under 35

U.S.C. 102(e) as being anticipated by Shake et al. (U.S. Patent US 7,079,765 B2).

Regarding claim 1, as it is understood in view of the above 112 problem, Shake discloses a method of estimating of OSNR comprising: a) selecting a portion of the signal (fig. 12, optical gate 171); b) measuring, at least once, at least an indication of the selected portion of the signal; c) repeating selecting a portion of the signal, and measuring (fig. 12, photoelectric converter 15); and d) estimating the OSNR from the results of at least one of the measurements, wherein consecutive measurements begin at times which differ by more than a shortest interval from one data unit to the next data unit (fig. 12, signal processor 19; fig. 33, signal to noise ratio).

Regarding claim 4, Shake disclose that the data units are transmitted at same time interval (data frequency is f_0).

Regarding claim 5, as it is understood in view of the above 112 problem, and claims 6, 37-38, and 51-54, the estimating of the OSNR inherently results in at least one measurement of the signal and a measurement of the noise and calculate the OSNR from the measurement results.

Regarding claims 14-15, as they are understood in view of the above 112 problem, Shake further discloses that the data comprises two different amplitudes, and one of the amplitude is zero (data comprises "1" and "0").

Regarding claim 31, Shake discloses measuring data with one detector for a channel.

Regarding claims 32-33, as they are understood in view of the above 112 problem, Shake discloses measuring data at different time intervals.

Regarding claim 55, Shake discloses an apparatus (fig. 12) adapted for in-channel estimation of the OSNR of a digital signal comprising a series of data units transmitted at a data rate less than or equal to a maximum data rate, each data unit having one of a discrete set of different amplitudes, the apparatus comprising: a) a gate (fig. 12, optical gate 171) which gates the digital signal, selectively blocking data units transmitted at some times while allowing data units transmitted at other times to pass through; b) a filter which filters the gated signal, substantially reducing frequency components at frequencies comparable to the maximum data rate (fig. 12, photoelectric converter 15. Note that the detector itself acts as a filter which filters the signal and substantially reduce high frequency components); c) a detector (fig. 12, photoelectric converter 15) which makes measurements of the signal; and d) a data analyzer (fig. 12, signal processor) which is operative to estimate the OSNR using results of the measurements.

Regarding claim 56, Shake further discloses make measurements during specified intervals of time related to the timing of the gate.

Claim Rejections - 35 USC § 103

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10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 2-3, 7-13, 16-30, 34-36, 39-50, and 57-66 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shake et al. (U.S. Patent US 7,079,765 B2) in view of Mittal et al. (U.S. Patent US 6,915,076 B1).

Regarding claims 2 and 21, Shake has been discussed above in regard with claim 1. Shake differs from the claimed invention in that Shake does not specifically disclose that the signal is transformed before measuring. However, it is well known in the art to transform a signal nonlinear before measuring. For example, Mittal discloses to transform a signal before measuring (for example, fig. 1, the signal is transformed nonlinearly with an optical amplifier 110 before measured by photodetector 120). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate a signal transformation before measuring, as it is disclosed by Mittal, in the system of Shake in order to increase the signal intensity and reduce detection error.

Regarding claims 3, 7-13, 16-19, 32-33, 36, and 47-50, Shake discloses repeatedly temporally gating the signal. It is inherent that a sequence of N data units is admitted in the system of Shake. Claims 8-13, 16-19, 32-33, 36, and 47-50 are simply obvious variation of different number for the integer N and different time variation of the gating points.

Regarding claims 20-30, Shake and Mittal have been discussed above in regards with claims 1-3. the modified system of Shake and Mittal differs from the claimed invention in that Shake and Mittal do not specifically disclose the specific types of filters. However, Examiner takes Official Notice that the cited filters are well known in the art. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate the filters in the modified system of Shake and Mittal in order to process signals and simplify the detection system.

Regarding claim 39, Shake further disclose making a first and a second measurements for the signal.

Regarding claims 40-46, Shake further discloses to estimate OSNR.

Regarding claims 57-64, the cited limitations are related to intended use and do not further provided limitation of the claimed structure of the apparatus and they obvious variation in functions of the system, therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to configure the system of Shake to operate in the variety of functions in order to obtained more accurate estimation of OSNR.

Regarding claim 65-66, Shake differs from the claimed invention in that Shake does not specifically disclose an optical network comprising the apparatus for estimating OSNR and use a partially reflecting flat surface to divide an optical beam. However, Shake further discloses that the OSNR estimation apparatus is used for monitoring optical WDM signal and use a partially reflecting flat surface to divide an optical beam. Therefore, it would have been obvious for one of ordinary skill in the art at the time

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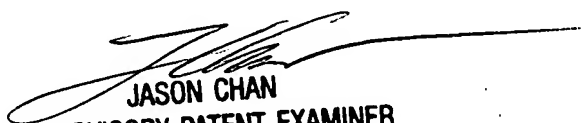
when the invention was made to incorporate the apparatus for estimating OSNR in an optical network in order to monitor the signal quality of the signal and ensure communication services.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

qzw
6/20/2007


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